Biochem. Cell. Arch. Vol. 9, No. 2, pp. 155-156, 2009 | *ISSN 0972-5075*

SOME MICROBIOLOGICAL STUDIES OF POLLUTED KALI RIVER WATER AT MEERUT

Shilpi Bhargava*, Usha Saxena and Ashok K. Bhragava

Ecology Research Lab, Department of Botany, Maharaj Singh College, Saharanpur - 247 001, India
*Department of Pathology, Subharti Medical College, Meerut - 250 115, India

(Accepted 1 July 2009)

Abstract – Disposal of liquid wastes of distilleries, tyre factory and sewage wastes in natural Kali river water have resulted serious problem. Thus, in the present work an attempt has been made to evaluate plankton population in the polluted Kali river water near down stream site selected before Modinagar. Observation shows that Most Probable Number of Coliform found highest in monsoon season of year 2007-2008. Likewise, Standard Plate Count also found highest in monsoon season. Observation also indicates high phytoplankton count winter season.

Key word : Coliform, MPN, SPC, phytoplankton.

INTRODUCTION

Water is essential for the survival of any form of life. The zooplankton and phytoplankton of most Indian river consists of diverse assemblage of major taxonomic groups. The fast growth of flora and fauna led to rapid scarcity of safe drinking water. Much of ill health in developing countries is largely due to lack of safe drinking water. (Kiley, 2007; Bhuvaneshwari and Devika, 2005). Many workers in the past carried such research work related to biological characteristics of polluted water (Aneja, 2001; EPA, 2002; Anabuganapathi *et al,* 2003, Kiley, 2007; and Manoja Das, 2008).

Coliforms are group of bacteria which are facultative anaerobic, gram negative, non sporing and rod shaped which can ferment lactose with gas formation with in 48 hours at 35^0C (Willey *et al,* 2007). The presence of coliforms and phytoplankton in water is an indicator of surface water contamination, regarded as unpotable (Manoja Das, 2008).

MATERIALS AND METHODS

Six water samples were collected from water bodies of 3 sites of Kali river at Meerut. Three site includes up stream site 'A', mid stream 'B', down stream site 'C' of Kali river at Meerut. The water samples were collected in sterilized BOD bottles and analyzed on the same day of collection. The planktons of river were collected with the help of fine plankton net. The known quantity of water was passed through filter and concentrated in the desired quantity, 1 ml of the concentrate was taken and placed in a sedgwick Rafter counting cell. Counting of the organism was done by applying the following formula –

$$\text{Plankaton/l} = \frac{(a \times 1000)}{1} \text{ C}$$

where a = average number of planktons in one small counting chamber of Sedgwick Rafter counting cell.

c = ml of plankton concentrate.

1 = Volume of original filtered in litre.

RESULTS AND DISCUSSION

Biological characteristics of river water found in and around Kali river given in table 1 & 2. Table 1 summarizes mean results of 3 sites samples where as table 2 describes phytoplanktons of 3 study site separately.

Results of MPN values and SPC values of coliform given in table 1. Observation shows that highest MPN values found in monsoon season of the year 2007 (70.0 MPN/100 ml + 4.30, while these values are lowest in

Table1 : Quantitative analysis of seasonal variation in bacteriological parameters of river Kali at Meerut.

Year	Seasons	MPN/100 ml	SPC/ml (x 10^3)
2007	Summer	42.0 ± 3.80	28.0 ± 3.10
	Monsoon	70.0 ± 4.30	60.0 ± 4.80
	Winter	18.0 ± 4.20	23.0 ± 2.80
	Average	43.3 ± 3.75	37.0 ± 4.60
2008	Summer	35.0 ± 3.50	18.0 ± 3.00
	Monsoon	65.0 ± 2.60	50.0 ± 4.60
	Winter	16.0 ± 2.10	22.0 ± 2.40
	Average	38.6 ± 4.25	30.0 ± 2.95

Table 2 : Seasonal variation in phyto plankton parameters of river kali at three study sites 'A', 'B' and 'C' during year 2007-2008.

Phytoplankton (ì/l)/site	2007				2008			
	Summer	Monsoon	Winter	Average	Summer	Monsoon	Winter	Average
Phytoplankton at site A	200.00 ± 38.20	360.00 ± 29.40	380.00 ± 20.40	313.33 ± 31.40	160.00 ± 20.00	220.00 ± 7.30	310.00 ± 28.40	230.00 ± 25.50
Phytoplankton at site B	220.00 ±20.00	280.00 ± 40.60	320.00 ± 26.00	273.33 ± 26.50	215.00 ± 24.00	240.00 ±20.80	305.00 ± 29.00	253.10 ±24.60
Phytoplankton at site C	280.00 ± 35.40	320.00 ± 48.30	340.00 ±60.50	313.32 ± 28.50	219.00 ± 36.40	260.00 ± 10.40	340.00 ± 20.00	266.33 ± 18.60
Total	700.00 ± 18.50	960.00 ± 23.90	1040.00 ± 21.50	900.00 ± 24.50	594.00 ± 21.50	720.00 ± 21.50	955.00 ± 28.40	749.33 ± 25.40

winter season of the year 2008 (16.0 MPN/100 ml ± 2.10). Similarly, results of total bacterial count done based on standard plate count are also given in table 1. Observation shows that lowest SPC (18.0 x 10^3 SPC/ml ± 3.00) found in summer season of year 2008. Likewise, highest SPC (60.0 x 10^3 SPC/ml ± 4.80) recorded in monsoon season of the year 2007.

Table 2 shows a comparison of seasonal variation of total phytoplankton studied at 3 study site of Kali river at Meerut. Result shows that total phytoplankton found highest (1040 ± 21.50) in winter season of year 2007, while these values found lowest (594.00 ± 25.50) in summer season of the year 2008. Our these findings matches with some previous work done (Aneja, 2001; Anabuganapathi et *al*,2003; Kiely, 2007 and Manoja Das 2008).

ACKNOWLEDGEMENT

Authors are thankful to Dr. K. K. Sharma, Principal, M.S. College, Saharanpur for encouragement.

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